PATENT COOPERATION TREATY

From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

17 MAR 2005

PCT

NOTIFICATION OF TRANSMITTAL OF THE INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Rule 71.1)

To:

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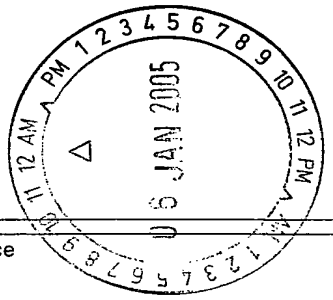

Date of mailing *(day/month/year)*	28.12.2004
Applicant's or agent's file reference P15256PC00	**IMPORTANT NOTIFICATION**

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/IB 03/04103	15.09.2003	17.09.2002

Applicant
CRUNDWELL, Frank Kenneth

1. The applicant is hereby notified that this International Preliminary Examining Authority transmits herewith the international preliminary examination report and its annexes, if any, established on the international application.

2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.

3. Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translation to those Offices.

4. **REMINDER**

The applicant must enter the national phase before each elected Office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices) (Article 39(1)) (see also the reminder sent by the International Bureau with Form PCT/IB/301).

Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary examination report. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned.

For further details on the applicable time limits and requirements of the elected Offices, see Volume II of the PCT Applicant's Guide.

The applicant's attention is drawn to Article 33(5), which provides that the criteria of novelty, inventive step and industrial applicability described in Article 33(2) to (4) merely serve the purposes of international preliminary examination and that "any Contracting State may apply additional or different criteria for the purposes of deciding whether, in that State, the claimed inventions is patentable or not" (see also Article 27(5)). Such additional criteria may relate, for example, to exemptions from patentability, requirements for enabling disclosure, clarity and support for the claims.

Name and mailing address of the international preliminary examining authority:

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PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

17 MAR 2005

Applicant's or agent's file reference P15256PC00	**FOR FURTHER ACTION**	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
International application No. PCT/IB 03/04103	International filing date *(day/month/year)* 15.09.2003	Priority date *(day/month/year)* 17.09.2002
International Patent Classification (IPC) or both national classification and IPC C22B3/00		
Applicant CRUNDWELL, Frank Kenneth		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 5 sheets, including this cover sheet.

   ☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

   These annexes consist of a total of 11 sheets.

3. This report contains indications relating to the following items:

   - I ☒ Basis of the opinion
   - II ☐ Priority
   - III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
   - IV ☐ Lack of unity of invention
   - V ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
   - VI ☐ Certain documents cited
   - VII ☐ Certain defects in the international application
   - VIII ☐ Certain observations on the international application

Date of submission of the demand	Date of completion of this report
08.04.2004	28.12.2004
Name and mailing address of the international preliminary examining authority: European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized Officer Bjoerk, P Telephone No. +49 89 2399-8452

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/IB 03/04103

I. Basis of the report

1. With regard to the **elements** of the international application *(Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17))*:

Description, Pages

2-7, 9-51	as originally filed
1, 8	filed with telefax on 27.08.2004

Claims, Numbers

1-58	filed with telefax on 27.08.2004

Drawings, Sheets

1/31-31/31	as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

   These elements were available or furnished to this Authority in the following language: , which is:

   ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).

   ☐ the language of publication of the international application (under Rule 48.3(b)).

   ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

   ☐ contained in the international application in written form.

   ☐ filed together with the international application in computer readable form.

   ☐ furnished subsequently to this Authority in written form.

   ☐ furnished subsequently to this Authority in computer readable form.

   ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

   ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

   ☐ the description, pages:

   ☐ the claims, Nos.:

   ☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

   (Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	1-58
	No:	Claims	
Inventive step (IS)	Yes:	Claims	1-58
	No:	Claims	
Industrial applicability (IA)	Yes:	Claims	1-58
	No:	Claims	

2. Citations and explanations

   see separate sheet

Re Item V

Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. The present application relates to a method of controlling a heap leach process by controlling the irrigation rate as a function of at least one of an aeration rate, an advection measurement and a temperature measurement as well as by controlling an aeration rate as a function of a determination of the oxidation rate of material within the heap.

   The application further relates to preliminary method steps of increasing the temperature of a heap (claim 29), of introduction and activation of microorganisms in order to avoid a "skin-plugging" effect (claims 34, 39 and 46).

   It is noted that the subject matter of claims 34 to 50 is covered in the parallel application IB03/04186 by the present applicant.

2. Reference is made to the following documents:

   D1: US-A-6 110 253
   D2: BRIERLEY C L: 'Bacterial succession in bioheap leaching' HYDROMETALLURGY, ELSEVIER SCIENTIFIC PUBLISHING CY. AMSTERDAM, NL, vol. 59, no. 2-3, February 2001 (2001-02), pages 249-255, ISSN: 0304-386X
   D3: MACLEOD F A ET AL: 'PLUGGING OF A MODEL ROCK SYSTEM BY USING STARVED BACTERIA' APPLIED AND ENVIRONMENTAL MICROBIOLOGY, WASHINGTON,DC, US, vol. 54, no. 6, June 1988 (1988-06), pages 1365-1372, ISSN: 0099-2240

   D1 discloses a high temperature heap bioleaching process of chalcopyrite bearing ore (abstract). The irrigation rate is said to depend on a number of factors. In particular, when the temperature of the heap is sufficiently raised, biooxidation of the chalcopyrite will be more rapid and the irrigation rate of process leach solution will also need to be higher in order to lower the pH and remove copper that has been dissolved (col.15, l.29-53). The heap is equipped with one or more temperature monitoring devices such as thermocouples (col.11, l.10-15).

3. The process of claim 1 differs from that described in D1 through the controlling of

an aeration rate of the heap as a function of the oxidation rate.

Such a feature leads to an optimized aeration rate according to the description on page 27, lines 19-25.

Neither D1 nor any of the remaining prior art cited hints at controlling an aeration rate of the heap as a function of the oxidation rate. D1 appears to only measure the oxygen level in the heap.

Consequently, the subject matter of claim 1 and of its dependent claims 2 to 54 fulfills the requirements of Art.33(2) and (3) PCT.

4. Claims 55 to 58 refer to the description and the figures and their subject matter does therefore not comply with Rule 6.2(a) PCT.